Amendments to the Claims

1. (Thrice Amended) A composition for coating or touching up or both coating and touching up a metal surface, said composition comprising water and:

(A) from about 0.5 millimoles per kilogram to about 240 millimoles per kilogram, a unit hereafter abbreviated as "mM/kg" of a component of fluorometallate anions, each of said anions consisting of:

(i) at least four fluorine atoms; and

(ii) at least one atom of an element selected from the group consisting of titanium, zirconium, hafnium, silicon, aluminum, and boron, and, optionally, one or both of

(iii) at least one ionizable hydrogen atom; and

(iv) at least one oxygen atom;

(B) from about 0.5 grams/liter to about 10 grams/liter, a unit hereafter abbreviated as g/l, of a component of phosphorus-containing inorganic oxyanions or phosphonate anions or both phosphorus-containing inorganic oxyanions and phosphonate anions calculated as the stoichiometric equivalent of H_3PO_4 ; [and]

(C) from about 0.5 g/l to about 3.5 g/l of hexavalent chromium[,]; and

(D) from about 0.10 g/l to about 2.20 g/l of trivalent chromium cations; and

(E) a component of surfactant molecules that are not part of any of immediately previously recited components, said surfactant containing carbon atoms and fluorine atoms, said fluorine atoms bonded directly to carbon atoms in the molecules and being selected from the group consisting of anionic surfactants, nonionic surfactants, and cationic surfactants;

said liquid composition comprising not more than 0.06% of dispersed silica and silicates.

7. (Thrice Amended) A composition for coating or touching up or both coating and touching up a metal surface, said composition being made by mixing together a first mass of water and at least the following components:

(A) a second mass of a water-soluble source of fluorometallate anions to provide in the composition from about 0.5 mM/kg to about 240 mM/kg of the fluorometallate anion, each of said anions consisting of:

(i) at least four fluorine atoms; and

(ii) at least one atom of an element selected from the group consisting of titanium, zirconium, hafnium, silicon, aluminum, and boron; and, optionally, one or both of

(iii) at least one ionizable hydrogen atom[,] ; and

(iv) at least one oxygen atom;

(B) a third mass of one or more water-soluble sources of phosphorus-containing inorganic oxyanions, phosphonate anions or both phosphorus-containing inorganic oxyanions and phosphonate anions; to provide in the composition from about 0.5 g/l to

about 10 g/l, calculated as their [stoichiontic] stoichiometric equivalent of H_3PO_4; [and]

(C) a fourth mass of a water-soluble source of hexavalent chromium cations to provide the composition with from about 0.5 g/l to about 3.5 g/l of hexavalent chromium cation[.];

(D) a fifth mass of a component to provide the composition with from about 0.10 g/l to about 2.20 g/l of chromium(III) cation; and

(E) a sixth mass of a component of surfactant molecules that are not part of any of immediately previously recited components, said surfactant containing carbon atoms and fluorine atoms, said fluorine atoms bonded directly to carbon atoms in the molecules and being selected from the group consisting of anionic surfactants, nonionic surfactants, and cationic surfactants.

17. (Thrice Amended) A process for coating or touching up or both coating and touching up a surface, said surface comprising at least one area of bare metal, at least one area of coating over an underlying metal substrate, or both of at least one area of bare metal and at least one area of coating over an underlying metal substrate, said process comprising operations of:

(I) covering the areas to be coated, touched up, or both coated and touched up with a layer of a liquid composition, said liquid composition having been made by mixing together a first mass of water and at least the following components:

(A) a second mass of a water-soluble source of fluorometallate anions to provide in the composition from about 0.5 mM/kg to about 30 mM/kg of the fluorometallate anion, each of said anions consisting of:

(i) at least four fluorine atoms; and

(ii) at least one atom of an element selected from the group consisting of titanium, zirconium, hafnium, silicon, aluminum, and boron; and, optionally, one or both of

(iii) at least one ionizable hydrogen atom; and

(iv) at least one oxygen atom;

(B) a third mass of one or more water-soluble sources of phosphorus-containing inorganic oxyanions, phosphonate anions or both phosphorus-containing inorganic oxyanions and phosphonate anions; to provide in the composition from about 0.5 g/l to about 10 g/l, calculated as their [stoichiontic] stoichiometric equivalent [or] of H_3PO_4 ; [and]

(C) a fourth mass of a water-soluble source of hexavalent chromium cations to provide the composition with from about 0.5 g/l to about 3.5 g/l of hexavalent chromium cation;

(D) a fifth mass of component to provide the composition with from about 0.10 g/l to about 2.20 g/l of chromium(III) cation[,] ; and

(E) a sixth mass of a component of surfactant molecules that are not part of any of immediately previously recited components, said surfactant containing carbon atoms and fluorine atoms, said fluorine atoms bonded directly to carbon atoms in the molecules and being selected from the group consisting of anionic surfactants, nonionic surfactants, and cationic surfactants;

said composition not comprising more than about 0.060% of dispersed silica and silicates; and

(II) drying into place over the surface the liquid layer formed in operation (I).

22. (Previously Presented)The process according to claim 19, wherein:
the second mass comprises fluorozirconate anions in an amount that corresponds to a concentration, in said composition, of fluorozirconate anions that is within a range from about 18 to about 30 mM/kg, inclusive of 18 and 30 mM/kg;
the third mass corresponds to a total concentration of phosphorus-containing inorganic oxyanions and phosphonate anions, calculated as its stoichiometric equivalent as H_3PO_4, that is within a range from about 0.50 to about 1.00 g/l, inclusive of 0.50 and 1.00 g/l;
the fourth mass comprises chromic acid in an amount that:
corresponds to a total concentration, in said composition, of hexavalent chromium cations within a range from about 2.25 to about 3.5 g/l, inclusive of 2.25 and 3.5 g/l;
is the source of hexavalent chromium for the composition; and
together with a sixth mass of reducing agent that is also mixed into the composition, is also the source of the trivalent chromium ions for the composition; and
said sixth mass of reducing agent corresponds stoichiometrically, in its reaction with chromic acid, to a concentration, in said composition, of chromium(III) ions that is within a range from about 1.25 to about 2.20 g/l, inclusive of 1.25 and 2.20 g/l;
in said liquid composition, there is a ratio of hexavalent chromium to chromium(III) ions that is within a range from about 2.5:1.00 to about 1.30:1.00, inclusive of 2.5:1.00 and 1.30:1.00;
there is additionally mixed into said composition an eighth mass of hydrofluoric acid that corresponds to a concentration, in said composition, that is within a range from about 0.70 to about 1.3 ppt, inclusive of 0.70 and 1.3 ppt;

there is also mixed into said composition a seventh mass of fluorinated alkyl ester surfactant molecules that corresponds to a concentration, in said composition, that is within a range from about 0.070 to about 0.13 ppt, inclusive of 0.070 and 0.13 ppt.